

In the Claims:

1. (Currently Amended) A method for inferring a requested sequential cell from a candidate cell, ~~during the generation of a netlist;~~ comprising the steps of:

- a) representing the requested cell as a mathematical expression;
- b) representing the candidate cell as a mathematical expression;
- c) performing an operation on the requested cell representation with the candidate cell representation to return at least one value;
- d) providing a rule corresponding to each returned value; and
- e) transforming the candidate cell into the requested cell by performing each rule corresponding to each returned value; and
- f) generating a netlist using the transformed candidate cell;

wherein the operation performed comprises dividing the polynomial representation of the candidate cell with the polynomial representation of the requested cell.

2. (Original) The method of Claim 1, wherein the mathematical representations of the candidate cell and the requested cell are polynomials.

3. (Cancel)

4. (Previously Amended) The method of Claim 1, wherein the polynomials comprise one or more multinomials corresponding to logical elements.

5. (Original) The method of Claim 4, wherein the multinomials are selected from the group consisting of Rst, Lr, St, Ls, Sc, Mu, Re, Lre and T.

6. (Previously Amended) The method of Claim 1, wherein the step of dividing the polynomial representations returns at least one multinomial corresponding to necessary inhibitions, transformations and inferences.

7. (Original) The method of Claim 1, wherein the steps are implemented by a computer.

8. (Currently Amended) A method for inferring a requested sequential cell from a candidate cell, ~~during the generation of a netlist;~~ comprising the steps of

- a) representing the requested cell as a P_{req} polynom having a multinom of smallest degree;
- b) representing the candidate cell as a P_{cand} polynom;
- c) if neither P_{req} nor P_{cand} equals zero, setting a multinom Z_{req} equal to the multinom of smallest degree of P_{req} , and if either P_{req} or P_{cand} equals zero, performing step f);
- d) determining whether P_{cand} comprises multinoms divisible by Z_{req} and if so, setting Z_{cand} equal to the smallest degree multinoms of P_{cand} divisible by Z_{req} , otherwise setting a polynom P_{inhib} equal to P_{cand} , then setting P_{cand} equal to zero and performing step c);
- e) adding to P_{inhib} multinoms of P_{cand} having smaller degree than Z_{cand} , subtracting Z_{cand} from P_{cand} , subtracting Z_{req} from P_{req} , adding the polynom quotient of Z_{cand} divided by Z_{req} to a polynom $P_{transform}$, and then performing step c); and
- f) if P_{req} equals zero, then adding P_{cand} to P_{inhib} and if P_{cand} equals zero, then adding P_{req} to a polynom $P_{infer}[[.]]$ and
- g) generating a netlist using the candidate cell.

9. (Original) The method of Claim 8, wherein the polynoms P_{inhib} , $P_{transfer}$ and P_{infer} comprise multinoms, further comprising the steps of providing rules corresponding the multinoms of P_{inhib} , $P_{transfer}$ and P_{infer} and applying the rules to the candidate cell to transform the candidate cell into the requested cell.

10. (Original) The method of Claim 9, wherein the polynomials P_{cand} and P_{req} and the multinoms Z_{cand} and Z_{req} comprise major and minor multinoms and step d) further comprises determining whether any major multinoms present in Z_{req} are also present in P_{cand} .

11. (Original) The method of Claim 10, wherein the multinoms Z_{req} and Z_{cand} have a degree and the polynom quotient is obtained by setting the degree of Z_{req} and Z_{cand} to 1 and then dividing Z_{cand} with Z_{req} .

12. (Original) The method of Claim 8, wherein the steps are performed by a computer.

13. (Original) The method of Claim 8, wherein requested cell comprises a flip-flop having a first synchronous function element in a first position and the step of representing a requested cell by a P_{req} polynom comprises setting P_{req} equal to a multinom corresponding to the first element and giving the multinom a degree of one.

14. (Original) The method of Claim 13, wherein the requested cell comprises a second function element in a position and the step of representing a requested cell by a P_{req} polynom comprises summing the multinom corresponding to the first element with a multinom corresponding to the second element, wherein the second element multinom has a degree corresponding to the second element position.

15. (Previously Amended) A system for inferring a requested sequential cell from a candidate cell during the generation of a netlist; the system comprising:

- a) means for representing the requested cell as a mathematical expression;
- b) means for representing the candidate cell as a mathematical expression;

c) means for performing an operation on the requested cell representation with the candidate cell representation to return at least one value;
d) means for providing a rule corresponding to each returned value; and
e) means for transforming the candidate cell into the requested cell by performing each rule corresponding to each returned value;
wherein the operation performed comprises dividing the polynomial representation of the candidate cell with the polynomial representation of the requested cell.

16. (Original) The system of Claim 15, wherein the mathematical representations of the candidate cell and the requested cell are polynomials.

17. (Cancel)

18. (Previously Amended) The system of Claim 15, wherein the polynomials comprise one or more multinoms corresponding to logical elements.

19. (Original) The system of Claim 18, wherein the multinoms are selected from the group consisting of Rst, Lr, St, Ls, Sc, Mu, Re, Lre and T.

20. (Previously Amended) The system of Claim 16, wherein the means for dividing the polynomial representations returns at least one multinom corresponding to necessary inhibitions, transformations and inferences.

21. (Original) The system of Claim 15, wherein the means are implemented by a computer.

22. (Original) A system for inferring a requested sequential cell from a candidate cell during the generation of a netlist; comprising:

- a) means for representing the requested cell as a P_{req} polynom having a multinom of smallest degree;
- b) means for representing the candidate cell as a P_{cand} polynom;
- c) means for setting, if neither P_{req} nor P_{cand} equals zero, a multinom Z_{req} equal to the multinom of smallest degree of P_{req} , and if either P_{req} or P_{cand} equals zero, initiating the function of f);
- d) means for determining whether P_{cand} comprises multinoms divisible by Z_{req} and if so, setting Z_{cand} equal to the smallest degree multinoms of P_{cand} divisible by Z_{req} , otherwise setting a polynom P_{inhib} equal to P_{cand} , then setting P_{cand} equal to zero and performing step c);
- e) means for adding to P_{inhib} multinoms of P_{cand} having smaller degree than Z_{cand} , subtracting Z_{cand} from P_{cand} , subtracting Z_{req} from P_{req} , adding the polynom quotient of Z_{cand} divided by Z_{req} to a polynom $P_{transform}$, and then initiating the function of means c); and
- f) means for adding, if P_{req} equals zero, P_{cand} to P_{inhib} and if P_{cand} equals zero, then adding P_{req} to a polynom P_{infer} .

23. (Original) The system of Claim 22, wherein the polynoms P_{inhib} , $P_{transfer}$ and P_{infer} comprise multinoms, further comprising means for providing rules corresponding the multinoms of P_{inhib} , $P_{transfer}$ and P_{infer} and applying the rules to the candidate cell to transform the candidate cell into the requested cell.

24. (Original) The system of Claim 23, wherein the polynoms P_{cand} and P_{req} and the multinoms Z_{cand} and Z_{req} comprise major and minor multinoms and means d) further comprises means for determining whether any major multinoms present in Z_{req} are also present in P_{cand} .

25. (Original) The system of Claim 24, wherein the multinoms Zreq and Zcand have a degree and the polynom quotient is obtained by setting the degree of Zreq and Zcand to 1 and then dividing Zcand with Zreq.

26. (Original) The system of Claim 22, wherein the means are implemented by a computer.

27. (Original) The system of Claim 22, wherein the requested cell comprises a flip-flop having a first synchronous function element in a first position and the means for representing a requested cell by a Preq polynom comprises means for setting Preq equal to a multinom corresponding to the first element and giving the multinom a degree of one.

28. (Original) The system of Claim 27, wherein the requested cell comprises a second function element in a position and the means for representing a requested cell by a Preq polynom comprises means for summing the multinom corresponding to the first element with a multinom corresponding to the second element, wherein the second element multinom has a degree corresponding to the second element position.

29. (Original) The method according to Claim 1, wherein:
said method is embodied in a set of computer instructions stored on a computer readable media; and
said computer instructions, when loaded into a computer, cause the computer to perform the steps of said method.

30. (Original) The system according to Claim 15, wherein each of said means comprise software components.